

Appl. No. 10/650,301
Amdt. dated February 28, 2005
Reply to Office Action of December 28, 2004

Remarks

The present amendment responds to the Official Action dated December 28, 2004. The Official Action rejected claims 25-33, 58, 60-62, 64, 66-71, 73-75, and 77-79 under 35 U.S.C. §103(a) based on Fernando U.S. Patent No. 5,802,360 (Fernando) in view of Okayama et al. U.S. Patent No. 5,684,728 (Okayama). Claims 63 and 65 were objected to as being dependent upon a rejected base claim but were indicated to be allowable if rewritten in independent form. This sole ground of rejection is addressed below.

Claims 1-24, 34-57, 59, 69, 71, 72, and 76 have been previously canceled. Claim 63 has been canceled without prejudice. Claims 25, 26, 60, 66, and 73 have been amended to be more clear and distinct. In particular, independent claims 25, 66, and 73 have been amended to clarify that the set of arithmetic control flags (ACFs) are being set by the results of packed data operations of individual packed data type elements. Support for this amendment can be found, for example, in Figs. 3A and 3B and at page 11, line 1 – page 14, line 5 of the Specification. Claim 60 has been amended to include the limitations of claim 63 which was indicated to be allowable if rewritten in independent form. It should be noted that claim 63 involved setting ACFs for each data element of the packed data and that claims 25, 66, and 73 have been amended to include setting an associated ACF based upon results of the packed data operations between packed data type elements.

Claims 25-33, 58, 60-62, 64-68, 70, 73-75, and 77-79 are presently pending. With its amendment to include the subject matter of claim 63, independent claim 60 stands in order for allowance based upon the previous indication that claim 63 would be allowable if written in

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independent form. Claims 61, 62, 64 and 65 are in order for allowance based upon their dependence on claim 60.

Interview Summary

The Examiner is thanked for the courtesy of a scheduled telephone interview concerning the above case on February 18, 2005. Dr. Gerald Pechanek, one of the inventors in the present application, also participated in the interview. In the telephone call, proposed claim amendments to claims 25, 66, and 73 which were previously emailed to the Examiner were discussed.

Presently amended claims 25, 66, and 73 are based upon proposed claims 25, 66, and 73 but have been further modified for clarity.

The Examiner agreed to concentrate his further search on the amendments.

The Art Rejections

As addressed briefly below, Fernando and Okayama do not support the Official Action's reading of them and the rejections based thereupon should be reconsidered and withdrawn.

Further, the Applicant does not acquiesce in the analysis of the relied upon art made by the Official Action and respectfully traverses the Official Action's analysis underlying its rejections.

Claims 25-33, 58, 60-62, 64, 66-71, 73-75, and 77-79 were rejected under 35 U.S.C. §103(a) based on Fernando in view of Okayama. Fernando describes a scheme for variable-delay instructions in a digital processor that allows for variable delay of an instruction to increase performance at different clock frequencies. The variable-delay feature allows flag-modifying

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instructions to execute in a differing number of clock cycles, depending on the application in order to achieve optimal performance at multiple operating frequencies. Fernando, Abstract and col. 3, lines 43-45. Fernando does not address modifying a set of flags based on packed data operations between packed data elements in multiple operands as presently claimed.

Okayama, as relied upon, generates and stores a flag in a program status word (PSW) as a result of a saturation arithmetic operation. Okayama, col. 10, lines 41-44. Once the PSW is set indicating an overflow or underflow, Okayama's system selects a positive maximum value or negative maximum value, respectively. Okayama, Abstract. Unlike the present invention, Okayama does not address the problem of conditional execution and its disclosure is silent with respect to packed data operations as presently claimed.

In contrast to Fernando and Okayama, aspects of the present invention address the problem of conditional execution by providing a programmer with the ability to specify for a non-branch type of instruction whether or not to execute the instruction based upon the results of packed data operations. Claim 25, as presently amended, reads as follows:

25. A method of condition generation comprising the steps of:
 receiving a first instruction having first and second operands containing packed data type elements, the packed data type elements in the first operand corresponding to the packed data type elements in the second operand and being associated with arithmetic condition flags (ACFs) from a set of ACFs;
 executing packed data operations specified in the first instruction on the corresponding packed data type elements;
 setting the associated ACF based upon the results of the packed data operations;
 determining whether to execute a further packed data operation on packed data type elements received in a second instruction, at least one packed data type element received in the second instruction being associated with an ACF from the set of ACFs; and

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executing the further packed data operation on the at least one packed data type element if the ACF associated with the at least one packed data type element is set. (emphasis added)

Fernando and Okayama, taken separately or in combination, do not teach and do not suggest "a first instruction having first and second operands containing packed data type elements, the packed data type elements in the first operand corresponding to the packed data type elements in the second operand and being associated with arithmetic condition flags (ACFs) from a set of ACFs," as presently claimed in claim 25. Furthermore, Fernando and Okayama, taken separately or in combination, do not teach and do not suggest "setting the associated ACF based upon the results of the packed data operations," as presently claimed in claim 25.

Fernando and Okayama, taken separately or in combination, do not teach and do not suggest "executing the further packed data operation on the at least one packed data type element if the ACF associated with the at least one packed data type element is set," as presently claimed in claim 25. Fernando merely determines whether to delay the execution time of a flag-modifying instruction where such determination is made while a flag-reading instruction is in a decode stage of the pipeline while Okayama merely sets threshold values in response to saturation operation.

Fernando and Okayama fail to recognize and address the problem of conditional execution of packed data operations in the manner advantageously addressed by the present claims. The claims as presently amended are not taught, are not inherent, and are not obvious in light of the art relied upon.

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Conclusion

All of the presently pending claims, as amended, appearing to define over the applied references, withdrawal of the present rejection and prompt allowance are requested.

Respectfully submitted,



Joseph B. Agusta
Reg. No. 52,547
Priest & Goldstein, PLLC
5015 Southpark Drive, Suite 230
Durham, NC 27713-7736
(919) 806-1600